How to Present a Technical Paper

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ABSTRACT—Andrew Griffith, PhD (senior analyst for IPA), authored a paper to address effective presentation skills (Las Vegas, 2006, DEV.02) [1]. His paper inspired more points to be addressed in this paper and a few additional ways to present a technical paper. Subjects include hand-off by multiple presenters, shaping material for an audience, handling tough audience questions, and finding your presentation style. AACE International offers a "Green Room" where recognized professional presenters and editors will offer mentoring services to authors new to presenting and to seasoned professionals who want to step up their skills. The Green Room and this paper are offered to help you overcome the challenges of presenting a paper and become a greater success!

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Introduction

Presentation skills are a balance of data, format, and verbal communication skills. This paper highlights the important points to an effective presentation; however, there is no substitute for the actual practice or experience of delivering a live presentation. The ideas in this paper are a guideline to help make presentations more memorable and dynamic.

The Title

The title is the author's introduction of the subject to the reader. An effective title will be descriptive and easy to remember. If the title can be remembered, then chances are the reader will not take the time to remember the author's name as well. To be effective, a title should be about six words or less.

Technical papers should not have ambiguous titles such as, "*10 Things We Remembered in the Bog After the Big Storm*." It would be more appropriate to title it as, "*Project Control Issues After Hurricane Katrina*." The reader is given several items of interest: a period of time (Hurricane Katrina), a location (US Gulf Coast), a subject (project controls).

Ambiguous titles indicate that the paper is only going to be useful to those who understand the title, or already know the author, or are seeking entertainment like a story time. If this is a paper being delivered at a conference the attendee may be looking for a break while waiting on another session to start at the conference. In this case, the author has attracted a disinterested attendee that may stay, decide to be difficult, or in some cases, hostile.

The Abstract

The purpose of an abstract is to entice potential customers to purchase the material or attend the presentation. Abstracts that are 100 to 175 words are generally well received because they are easy to read and to the point. Longer abstracts tend to be short versions of the material. Once a potential customer has finished reading the long version, there is a high likelihood that they will not attend the presentation or purchase the material.

When writing an abstract, keep the best material in the paper. Do not give away good ideas for free. Authoring a paper is a commercial enterprise. The abstract sells papers, books, invites authors to conferences, etc.

Basic Clarification

This document assumes that the author has written a paper and is preparing a presentation of that research. A technical presentation without a supporting paper is more "performance" value because there is no instrument to judge the content of the

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presentation. If there are no references, bibliography, no discussion, and at the end of the presentation, the audience is left with nothing except a few key concepts and a good time.

This is a disservice to a technical community that depends on research to advance the field of expertise. Without a paper, presenters (authors, researchers) have no vehicle available to serve as a calling card to be invited to another conference.

Presenter Responsibility

Presenters are invited to speak because they have a subject that is of interest, they are recognized as a world-class expert, or they have crowd appeal. The key is that they have been invited and are provided a platform to present. It is the responsibility of the presenter to control the look and feel of their subject content and themselves. This is not the responsibility of the inviting organization.

Always have a backup plan. If the inviting organization asks for a copy of the presentation to place into their venue, do not assume that everything will go smoothly. Keep a copy of the presentation on a flash drive and carry a laptop computer to the presentation room. If there is a problem with finding the presentation (it may have been lost, on the wrong session track, a previous revision, etc.), then a current copy can be quickly uploaded onto the computer. If the conference computer fails, and they have, then it takes just a few minutes to connect in the presenter's computer to continue with the presentation.

It is also the presenter's responsibility to be prepared to introduce themselves and the subject to the audience. The first slide is the subject slide that has the presentation title and the name of the presenter. The second slide is the presenter introduction slide. The second slide should have no more than a few points of reference about the presenter. This is not a curriculum vitae or resume. Select items like years of experience, education background, subject experience, years of membership, etc. that will confirm to the audience that you have experience with the subject so that they want to stay and listen.

Your Presentation Style

Presenters should learn basic speaking and presenting skills from a professional organization that specializes in communication. Such organizations prepare individuals in various speaking skills such as impromptu speaking and transition skills, and it equips the speaker to deliver more succinct communication. These organizations have basic curriculums that cover styles ranging from humorous to technical speeches. These organizations have course curriculums that take a year to complete and, after graduation, there are advanced courses that can be taken.

Fit the presentation to the audience. Avoid alienating audience members through using inside jokes, uncommon jargon, colloquial (informal speech) terms, etc. Write the paper and present the presentation to address an international audience.

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"Be yourself" is the best advice for any presenter. The best style of delivery for a presenter is the same way they discuss the same subject in an informal setting such as their office or away from work with friends. They are more relaxed and take more time to explain to friends and co-workers why their project is so interesting.

Preparing Attendees

While the conference staff is setting up the presentation for display, greet the attendees that are arriving. Build familiarity with the audience as they enter by asking them about how the conference is going, or ask about why they decided to come to the conference. This chat allows everyone to acquaint themselves with the presenter's voice and adjust to it ahead of time. This is especially useful with an international audience. The presenter can sometimes spot a potential difficult attendee and build a quick personal relationship to diffuse any difficult questioning during the presentation.

For a room of about 100 people, consider bringing 20 black and white copies of the paper and placing them in the front rows. Next, consider having five color copies of the presentation available. These can be used to auction seats. If there is nobody in the front row, offer a color copy to anyone willing to sit in the very front row. If there are seats available and there are people standing in the back of the room, entice them with a color copy if they will take a seat. It is amazing how effective this is.

Presentation Format

There are three basic formats that can be used to present the paper: serial; parallel; and ancillary. A combination of the three may be appropriate for the advanced presenter.

Serial content of the presentation follows the same organization of the paper. The story board for the presentation should be the same one developed in preparing the technical paper. See "*Storyboarding*" in "**How to Write a Technical Paper**" [2]. This method does not introduce new data or material and is the safest method for the first time presenter or for very difficult subjects.

Parallel presentation uses the same topical outline structure of the paper and uses more detailed graphs (in parallel to the graphs published) that would be too cluttered to publish in the paper. The presenter may also decide to leave out some data in order to allow for more focus on specific points of interest.

Ancillary technique introduces data or case studies that were also studied in the course of writing the paper but because of length restrictions of the paper, were not included. This type of presentation is more difficult and not suggested for the first time presenter. The problem rests with the audience member who has read the paper, has keen interest in the topic, and has prepared questions to ask at the presentation. Introducing new material

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becomes disruptive and the attendee has to adjust to the new material. The presenter must have a mastery of the data and subject or the presenter will loose the interest and attention of the audience.

Slides

Slide planning is important. The slides are the basic storyboard of the technical paper. Speakers use a slide presentation as the visual illustration and therefore, the slides will be incomplete by themselves. The speaker needs to decide how to introduce the slide, discuss the slide, and the transition to the next.

There are five things to avoid:

- over-simplification;
- over-complication;
- too much detail;
- too little detail; and,
- "trust me."

Of these five items, the two that contribute most to the dismissal of creditability are over-complication and "trust me." A technical presentation is based on answering the fundamental question around why the attendee should believe what they are being told.

The font of a slide should be 20 point at a minimum. Test the slide for readability by placing it on the floor and read it while standing. If it is too difficult to read, then there is either too much text or the text size is too small. This technique applies to the graphics as well.

As the presenter walks through the presentation, the presenter must control the data by only exposing key points as the presentation develops. Exposing too much data all at once will allow the audience to jump ahead and, in some cases, find the key point too early. This removes the impact of any emphasis that the presenter may have planned.

The features of presentation software that are designed to sell the software are also the same features that contribute to poor presentations. A technical presentation should keep the attendee's focus on the outline while the presenter builds the case study a step at a time until reaching the conclusion. There may be one slide of great importance that needs to have a bit of showmanship or glitz so the presenter can break the attendee's focus and refocus it on the important slide. In this case, the presenter should change how the slide is presented, using one of the variety of slide effects. These are very disruptive, but they can be effective once. The downfall to a presentation is to use these effects on every slide because the attendees focus on the slide effects. At this point the attendee is not focused on the data, and the presenter has lost their attention on the discussion.

Laser pointers are another distracting device to the "attendees focus" on the presentation. The problem with a laser pointer is that it is hard to hold still from more than ten feet away. A laser pointer is even more difficult to hold still if the presenter is nervous or has a slight

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hand tremor. Watching a laser dot wiggle on a screen is another disruption to the attendee's attention. The technical mindset attendee wants to analyze why the laser pointer is moving erratically, determine if there is a health issue with the presenter, is the laser pointer faulty, etc. Use the software presentation automation instead of the laser pointer. Automate the slide to have a circle, or arrow popup to draw attention to a point on the slide that you would normally have used a laser pointer to address during a live presentation. Using this method requires more preparation time, but it provides rock solid focus to the points the presenter considers important. It demonstrates to the audience that the presenter has more command over the subject matter because the presenter is better prepared. Only use the laser pointer as a last resort for a question that was not anticipated.

A presentation with audio is very difficult. If the presentation has a movie clip or audio, then do not attempt to place the microphone in front of the computer. There is generally feedback issues and poor sound quality which is highly distracting to the audience. Time is wasted by the attendee trying to figure out what was said and what went wrong. Contact the staff in charge of audio-visual support and have them assist with getting a good connection made to make this work well.

Video is another problem. All conferences have a budget and unless there is a need for a high resolution video computer projector, then the conference will opt for a low cost projector suitable for slide presentations.

Also, check colors in the presentation with a projector before arriving at the conference. The color used for the slide will be different when viewed on the presenter's computer screen, printed on a color printer, printed on a color copier, and projected on screen. Sometimes there is little difference in shades. For example maroon and red may display as the same color as will turquoise and light blue. Consider also, that many people have some form of color blindness. It is best to select a few primary colors, and also use a few distinct patterns like a stripe, shade, and a polka-dot. The optimal slide is one that can be printed in black and white with few annotations and the data still retains clarity.

Finally, center most of the data to fit in the middle of the slide. Leave the top for the title and the sides and bottom for logos, borders, or in case there is technical difficulties getting the whole slide to project adequately on the screen.

Screens

There are a few common screen formats the presenter must handle. Ideally, a single screen where the bottom of the screen is chest high to the presenter is best. These are normally centered on the room and nearly everyone has a good view. The presenter is also able to stand anywhere in front of the screen and not block the view of the data.

Most conferences use hotels that have conference rooms that force the bottom of the screen to barely clear the top of a standard table height. This means that the presenter can not step in front of the screen because they would hide most of the data on the slide. In this

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case, the presenter must be able to discuss the slide from either side of the screen. This means the presenter has to decide how to point out data on the far side of the screen without crossing in front of it.

Once in a while, a conference has an auditorium large enough to have two screens. This is especially challenging. Generally, the screens are too high for the presenter to walk up to and point to anything. Also, to address one screen leaves the other half of the audience disadvantaged because their screen has been ignored. In these rooms not only is it too far to adequately use a laser pointer, the laser dot may be too small to be seen against the intensity of the projection. Here is where having practiced and predetermined arrows and circles are an advantage to the expert presenter.

Speaking

When conferences provide audiovisual support, use the microphone that is furnished. It is a huge problem when the presenter decides that their voice is loud enough to carry throughout the room because it often does not carry far enough. The speaker system is designed to fill the room and leave few, if any, dead spots for the audience. Also, after the first presentation, the audience has adjusted to listening to the speaker system. When a presenter does not use the microphone (or if one is not provided), then consider that only one-third of the audience will adequately hear the presenter. The one-third of the audience that hears will be those directly in front of the speaker. When speaking without a microphone it is even more important to maintain eye contact with everyone in the audience. First, they get eye contact and feel like they are being addressed. Second, the presenter is constantly changing the direction of their voice in order for everyone to have an equitable chance of hearing what is being said.

Practice the presentation with the slides to a point that it is memorized. It is up to the presenter to instill confidence in the audience that they have mastery of their subject and can succinctly discuss it while using the presentation for illustration. Do not make a mistake of reading from a script, note cards, or the slides. Attendees tend to walk out of these presentations because the presenter has failed to display mastery in the subject and instill confidence to the attendee.

A good practice is to have the computer that runs the presentation screens set up in front of the lectern. This allows the presenter to glance at the presentation slide that is being displayed and continue addressing the audience. The only time it is acceptable to look at a screen is when it is necessary to draw attention to a particular point. Address the screen only for emphasis.

The audience can read. They will read everything on the screen. Technical audiences will also check spelling, grammar, font, colors, and math. Making mistakes in these areas will disrupt the presentation because attendees will offer to help the presenter correct the slide. Slides are illustrations but are not the discussion. Consider placing key points on the slide and provide discussion from the technical paper for each dot point on the slide. This is

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why it is very important to have a technical paper. The paper is the discussion, and the slide presentation is only the illustration. It is a common mistake and a disservice to the technical community to make the presentation the technical paper.

Plan to speak two minutes per slide. There are a few concepts involved with this point. Foremost, this pace of data seems to be the maximum amount that a technical audience can absorb in the timeframe. Since the audience may be international, their first language may not be the same as the speaker's. Also, it will take them a little more time to translate and understand the information they hear. This means that a presenter's speaking speed must be slower to be understood. A slower speech delivery appears more deliberate to the audience and conveys that the speaker has more insight. Therefore, use this concept as an advantage.

Timing

Some contingency planning has to be made for the duration of the presentation. Conferences do not allow presenters to exceed their time allocations. Attendees have pre-determined when to take their breaks, and that seems to always be more important than the presentation. When handling interactive questions throughout the presentation, a presentation has a risk of running too long. Therefore, identify ahead of time which slides could be skipped to get back on schedule. If questions will be held to the end of the presentation, then consider numbering the slides so that the presentation can be quickly set to the slide so that the question can be addressed with the slide.

Multiple Presenters

Many presentations fail because there are more than two presenters for a one-hour presentation. It is disruptive to change out presenters for several reasons. The biggest disruption is simply changing presenters. The audience quickly settles into the cadence set by the first presenter. Changing cadence means that the audience may have to adjust to a louder or softer voice, a different accent, and different speed of data delivery.

Another problem with multiple presenters is when neither of them fully understands the topic that the other is presenting. To the audience, this speaker's qualifications may appear in question. Sometimes, it appears that the presenters are in disagreement and, in the worse-case scenario, the presenters actually have a disagreement in front of the audience.

Unless the presenters have a track record of presenting together, it would be a better practice to elect one to do the presenting and the other as a subject matter expert for questions at the end.

Sometimes two presenters work very well together largely because they have the same temperament, the same command of the subject, and are complimentary with one another.

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In addition, they have practiced their delivery several times. When there are two presenters, it is best to rehearse until the presentation appears to be performance quality.

Handling Questions

Set the audience expectations before beginning the presentation. Let them know if questions will be accepted during the presentation or if questions should be held until the end. If questions will be held to the end, then consider numbering the slides and showing the attendees where to find the slide number to be referenced later.

Always repeat the question before answering. Rarely do attendees have access to a microphone and the rest of the attendees would like to understand the question also. This also helps minimize duplicate questions. Be sure that the question is understood before answering.

There are times when there are difficult attendees. The questions they ask may actually have been covered and clearly understood by everyone else, but for some reason, this attendee is going to take issue with anything and everything. There is only one thing to do: be sincerely apologetic and ask to set aside more time after the presentation to answer their questions and concerns in more detail. This buys time and provides creditability to the presenter.

Worse-Case Scenario

There are rare occasions that the laptop or projector fail and there are limited options as to how to continue with the presentation. Assume the conference staff is going to have to replace the equipment while the presentation continues. In the meantime, since the presentation is mostly illustrations, a seasoned presenter can continue without projecting the presentation on the screen. This is a worse-case scenario but it can greatly demonstrate the mastery of the presenter over the presented subject. More skill will be required by the presenter to paint a visual picture. Technical people with story telling capability excel in this scenario. All is not lost and there are a few other things that can be done to prepare for this scenario.

If the presentation is on the personal laptop computer, the presentation can begin without the screen projector. The attendees with the color copies of the technical paper become the presenter's advocates. As the presentation is delivered, the rest of the audience will constantly check the response of the paper holders for "buy-in." The presenter should be prepared to focus attention to figures and tables in the paper for the paper holders to confirm. The presenter needs these paper holders to bob their heads in agreement during the screen-less presentation.

The key is to leave nothing to chance. There may an event that is completely out of the control of the presenter and the conference. However, the presenter has a vested interest

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to be heard because they may need the follow-up contacts for their workplace. Most presenters have already invested a considerable sum of money to attend the conference. It would be a shame not to take a few more small steps to pre-plan for a worse-case scenario.

Concluding the Presentation

A conclusion is important for the presentation. A lot of detail can be covered inside of an hour. If the attendees forget everything else, they will generally remember one or two points about a topic. Remind the attendee of all that has been discussed. Identify any call to action or highlight any change that is being promoted.

Final Point

When preparing a presentation, follow the storyboard prepared during the writing of the technical paper. Keep the slides simple. Practice rehearsing the presentation to get the cadence correct to meet the time available for the presentation. Practice the presentation with a group before arriving at the conference.

Green Room

A few conferences offer a "Green Room". This room should be equipped with a screen and projector so that the presenter can make a "real time" presentation. The concept comes from the theater companies where the director offers help and mentoring to the actors. If the conference offers a mentoring team in the green room, they can offer tips on improvements to the slides, and style of presentation to better fit the venue of the conference. If asked, a mentor may attend the live presentation, take notes, and debrief the presenter afterwards. The mentor will review the audience comment cards first as a check to their notes and then identify a few positive improvements.

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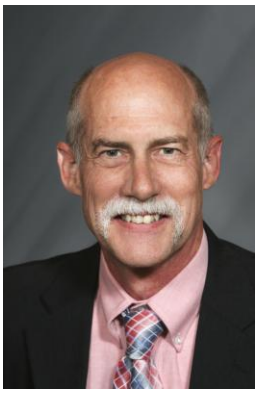

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